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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/746,678	12/22/2000	Mitchell D. Trott	15685P038	1645

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EXAMINER

DAO, MINH D

ART UNIT	PAPER NUMBER
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2682

DATE MAILED: 10/24/2003

5

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/746,678	TROTT, MITCHELL D.	
	Examiner	Art Unit	
	MINH D DAO	2682	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-35 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 12-19 is/are allowed.
- 6) ☒ Claim(s) 1,4-7,9-11,20-22 and 28-30 is/are rejected.
- 7) ☒ Claim(s) 2,3,8,23-27 and 31-35 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) <u>5</u> . | 6) <input type="checkbox"/> Other: _____ |

Detailed Actions

Specification

1. **Objection to specification:** On page 2, line 7, applicant is required to insert the date when the application was filed.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1,4,6,7,9-11,20-22,28-30 are rejected under 35 U.S.C. 102(b) as being anticipated by Gerlach et al. (US Patent 5,471,647).

Regarding claim 1, Gerlach teaches a method for mitigating interference caused by ghost signals (Col. 3, lines 30-33; in this case, the ghost signal as claimed read on the cross-talk in reference Gerlach) generated by an antenna array system (Fig.1, item 12), the method comprising: determining an effective weight of a ghost signal (Col. 2, lines 59-67; Col. 3, lines 1-6); and obtaining a downlink beamforming strategy as a function of the effective weight (Col. 2, lines 3-5), the downlink beamforming strategy for

transmitting a downlink signal to a receiver (Col. 3, lines 64-67), wherein the downlink beamforming strategy provides an interference mitigated region at a location (Col. 4, lines 6-13) susceptible to interference caused by the ghost signal.

Regarding claim 4, Gerlach teaches the method of claim 1, further comprising: varying the intensity of the interference mitigate region (Col. 3, lines 30-47; since the weights of the downlink are varied, the intensity of the interference mitigate region is also varied as claimed).

Regarding claim 6, Gerlach teaches the methods of claim 1, wherein the ghost signal effects a channel on which the downlink signal is transmitted (Col. 2, lines 41-43).

Regarding claim 7, Gerlach teaches the method of claim 1, wherein the downlink signal is transmitted on a first channel (Col. 2, lines 41-43).

Regarding claim 9, Gerlach teaches the method of claim 7, wherein the ghost signal further affects the first channel (Col. 2, lines 41-43).

Regarding claim 10, Gerlach teaches the method of claim 9, wherein the first channel is utilized by first remote user terminal at the location (Col. 3, lines 7-17, Col. 4, lines 5-14).

Regarding claim 11, Gerlach teaches the method of claim 10, wherein the first channel is further utilized by a second remote user terminal at a different location (Col. 3, lines 7-17, Col. 4, lines 5-14).

Regarding claim 20, Gerlach teaches a method for reducing ghost signal (Col. 3, lines 45-47; in this case, the ghost signal as claimed read on the cross-talk in reference Gerlach) interference caused by a transmitter Fig. 3A, Item 14) employing an antenna array (Fig. 1, item 12), the method comprising: determining that transmission of at least a first downlink signal by the transmitter will produce a ghost signal (Col. 2, lines 1-5); adjusting a downlink weight corresponding to the first downlink signal to mitigate the ghost signal (Col. 3, lines 30-33); and transmitting the first downlink signal in accordance with the downlink weight (Col. 3, lines 64-67).

Regarding claims 21 and 29, Gerlach teaches that the ghost signal is mitigated at a first location corresponding to a first remote user terminal (Col. 3, lines 7-17, Col. 4, lines 5-14).

Regarding claims 22 and 30, Gerlach teaches that the downlink signal tended for the first remote user terminal (Col. 3, lines 7-17, Col. 4, lines 5-14).

Regarding claim 28, Gerlach teaches a machine-readable medium having stored thereon a set of instructions, which, when processed by a machine (Fig. 3, item 40; Col. 3, lines 43-48), cause the machine to perform a method for reducing ghost signal interference (Col. 3, 30-33; in this case, the ghost signal as claimed read on the cross-talk in reference Gerlach) caused by a transmitter employing an antenna array (Fig. 1, item 12), the method comprising: determining that transmission of at least a first downlink signal by the transmitter will produce a ghost signal (Col. 2, lines 1-5); adjusting a downlink weight corresponding to the first downlink signal to mitigate the ghost signal (Col. 3, lines 30-33); and transmitting the first downlink signal in accordance with the downlink weight (Col. 3, lines 64-67).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Gerlach et al. (US Patent 5,471,647).

Regarding claim 5, Gerlach fails to teach that the ghost signal is at least in part caused by transmitter intermodulation. However, the examiner takes official notice that the ghost signals partially caused by intermodulation signal is known in the art. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention that the ghost signals could have been partially caused by transmitter intermodulation since it has been well recognized that transmitter intermodulation can contribute to generate ghost signals.

Allowable Subject Matter

4. Claims 2, 3, 8, 23-27 and 31-35 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Regarding claim 2 and 3, Gerlach (US Patent 5,471,647) teaches the limitations set forth in claims 1. However, Gerlach fails to teach the method of claim 1, further comprising: determining a non-linear characteristic of the antenna array system; and determining the effective weight based on the non-linear characteristic of the antenna array system.

Regarding claim 8, Gerlach (US Patent 5,471,647) teaches the limitations set forth in claims 7. However, Gerlach fails to teach that the ghost signal affects a second channel.

Regarding claims 23 and 31, Gerlach (US Patent 5,471,647) teaches the limitations set forth in claims 21 and 29 respectively. However, Gerlach fails to teach that the downlink signal is intended for the first remote user terminal, and the ghost signal is mitigated at a second location corresponding to a second remote user terminal as specified in the claims.

5. Claims 12-19 are allowed.

The following is an examiner's statement of reasons for allowance:

Regarding claim 12, references Gerlach (US Patent 5,471,647) and Gu et al. US Patent 6,236,839 fail to teach a method for mitigating interference caused by ghost signals generated by an antenna array system, the method comprising: obtaining a first weight for a first downlink, signal; obtaining a second weight for a second downlink signal; determining a characteristic of a ghost signal that would result by the interaction of transmitting the first and second downlink signals; and adjusting the second weight to mitigate the ghost signal.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably

accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- a. Boros et al. (US 2003/0050016 A1) discloses Periodic Calibration on a Communication Channel.
- b. Boros et al. (US 2003/0032423) DISCLOSES Determining a Calibration Function Using at Least One Remote Terminal.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MINH D DAO whose telephone number is 703-305-5589. The examiner can normally be reached on 8:30 AM - 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, VIVIAN C CHIN can be reached on 703-308-6739. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-3900.

Minh Dao
Examiner
Art Unit 2682
October 7th, 2003 *MD*


VIVIAN CHIN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600

10/20/03